The invention claimed is:

1. A spindle motor for use in hard disk drives comprising:

a shaft, said shaft comprising a gradually expanding lower portion;

a bearing sleeve surrounding said shaft such that a bearing gap is formed between said shaft and said bearing sleeve; and

a plurality of pressure generated grooves being formed on one of an outer surface of said shaft and an inner surface of said bearing sleeve, wherein said gradually expanding lower portion expands toward an end face of said shaft, and wherein said gradually expanding lower portion of said shaft is provided with at least one fluid channel, said fluid channel comprising a large diameter.

2. The spindle motor according to Claim 1, wherein said bearing sleeve further comprises an inner surface complementing shape of said gradually expanding lower portion of said shaft, and wherein an asymmetrical groove pattern is provided on one of an outer surface of said gradually expanding lower portion of said shaft and said complementary shaped inner surface of said bearing sleeve.

3. The spindle motor according to Claim 2, wherein the asymmetrical grooved pattern is sinusoid-shaped.

4. The spindle motor according to Claim 2, wherein the asymmetrical grooved pattern is spiral-shaped.

5. The spindle motor according to Claim 2, wherein the asymmetrical grooved pattern is herringbone-shaped.

6. The spindle motor according to Claim 2, wherein the asymmetrical grooved pattern is formed as a part of a hydrodynamic radial bearing.

7. The spindle motor according to Claim 2, wherein the asymmetrical grooved pattern is formed as a part of a hydrodynamic axial bearing.

8. The spindle motor according to Claim 1 further comprising a counter-plate enclosing said bearing sleeve, , wherein an end face of said gradually expanding lower portion of the shaft faces the counter-plate.

9. The spindle motor according to Claim 1, wherein said gradually expanding lower portion of the shaft comprises a double conical extension.

10. The spindle motor according to Claim 1, wherein said gradually expanding lower portion of the shaft is pear shaped.

11. The spindle motor according to Claim 1, wherein said gradually expanding lower portion of the shaft is half spherical shaped.

12. The spindle motor according to Claim 1, wherein said gradually expanding lower portion of the shaft is spherical shaped.

13. The spindle motor according to Claim 1, wherein said gradually expanding lower portion of the shaft is a separate component attached to the shaft and being aligned to an end face of the shaft.

14. The spindle motor according to Claim 8, , wherein a grooved pattern is formed on the surface of said counter-plate.

15. A hydrodynamic bearing for use in a spindle motor, comprising:

a shaft;

a bearing sleeve, the bearing sleeve rotatably surrounding said shaft;

a counter-plate enclosing one end face of said bearing sleeve;

a bearing gap formed between the shaft, the bearing sleeve and the counter-plate, said bearing gap being filled with a bearing fluid; and

means for generating an excess pressure in the bearing fluid in the area of the counter-plate, the excess pressure being greater than the atmospheric pressure.

16. The hydrodynamic bearing according to Claim 15, wherein said means for generating an excess pressure comprise a grooved pattern which is formed on an outer surface of the shaft or on an inner surface of the bearing sleeve.

17. The hydrodynamic bearing according to claim 16, each groove of said grooved pattern includes a branch facing away from the counter-plate and a branch facing the counter-plate, wherein the branch facing away from the counter-plate is longer than the branch facing the counter-plate.

18. The hydrodynamic bearing according to claim 16, wherein the grooved pattern is part of a hydrodynamic radial bearing.

19. The hydrodynamic bearing according to claim 16, wherein said means for generating an excess pressure are formed on a thrust plate.

20. The hydrodynamic bearing according to claim 16, wherein said means for generating an excess pressure are formed on a cone-like extension of said shaft, said cone-like extension facing said counter-plate.